01-XXX

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ROUNDTRIP OR ONE-WAY: ENDEAVOUR TRANSPORTS LOCAL ASTRONAUT AND EXPERIMENTS

Two experiments from NASA's Glenn Research Center, Cleveland will be on board with local astronaut Carl Walz on Space Shuttle Endeavour's next flight. While Walz's stop is the International Space Station (ISS) where he'll become a new resident, Glenn's experiments will make a roundtrip during the 11-day mission. STS-108 is scheduled to launch November 29, 2001 at 7:41 p.m.

The premise behind COLLisions Into Dust Experiment (COLLIDE-2) is to study the collisions between small particles in planetary rings and the building blocks of planets that occur at very low speeds. For example, there is very little gravitational pull between rocks and dust in Saturn's rings, which causes even the slowest collisions to eject material. The experiment's predecessor, COLLIDE, determined that there is a threshold at which no material is ejected as a result of impact. COLLIDE-2 will continue these efforts by trying to identify the precise energy threshold. The experiment is being conducted in collaboration with researchers from the University of Colorado, Boulder, CO.

During its second flight, Microgravity Smoldering Combustion (MSC), which will be housed in a Get Away Special (GAS) canister, will test smoldering combustion in different airflow conditions using new imaging technology to record test results. Data gained from this experiment will help researchers understand the complex processes of smoldering combustion and lead to a better theoretical computer model of the mechanisms of smoldering combustion. This experiment is being conducted in collaboration with researchers from the University of California, Berkeley, CA.

A series of MSC experiments has been developed by Glenn scientists to examine smolder processes in an extremely low gravity (microgravity) environment as well as normal gravity. The microgravity setting is especially valuable because it permits scientists to study smoldering combustion mechanisms without the complications introduced by gravity. It also provides insight into how smoldering combustion behaves in the microgravity of space.

Glenn's presence is valued aboard ISS due to three of the Center's experiments already producing results. Physics of Colloids in Space (PCS), has been gathering data about basic physical properties of colloids (a system of fine particles suspended in a fluid) by studying three different colloid sample types since May 2001. PCS samples are behaving beautifully thus far. All six samples are being rehomogenized and restudied over different time segments of their evolution using a suite of diagnostic techniques.

Additionally, two Glenn-developed instruments will remain onboard for the station's lifespan: (1) Space Acceleration Measurement System, which measures accelerations caused by vehicle, crew and equipment disturbances and (2) Microgravity Acceleration Measurement System, which measures accelerations caused by vehicle motions and aerodynamic drag created as ISS moves through space.

Other Glenn-related experiments involve solar arrays, which generate ISS' power. Solar array turning mechanisms will have thermal blankets installed on them as a result of concerns of induced thermal stresses. Glenn analysts used an ISS power analysis code, SPACE, to determine the power generation capability for numerous scenarios. Glenn's results helped mission planners prepare for the EVA to install the blankets on the mechanisms that rotate the solar arrays.

Glenn is NASA's lead Center for all aspects of Microgravity Combustion Science, Fluid Physics and Transport Phenomena and Acceleration Measurement Programs. Its Microgravity Science Division (MSD) conducts and sponsors ground-based scientific and technological studies that lead to space experiments. These efforts contribute new scientific knowledge by studying the effects of low gravity (microgravity) on important chemical and physical processes to improve the quality of life on Earth and to advance the presence of humans in space. The MSD will continue to contribute to future Shuttle and ISS missions in many ways including the design, buildup, testing and integration of experiment hardware packages.

More information on Glenn's Microgravity Science Division is available on the Internet:
http://microgravity.grc.nasa.gov

More information on Glenn's Power and Propulsion Office is available on the Internet:
http://

More information on STS-108 is available on the Internet:
http://spaceflight.nasa.gov/shuttle

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